



# **Protective Action Guides (PAGs) Update**

January 2009

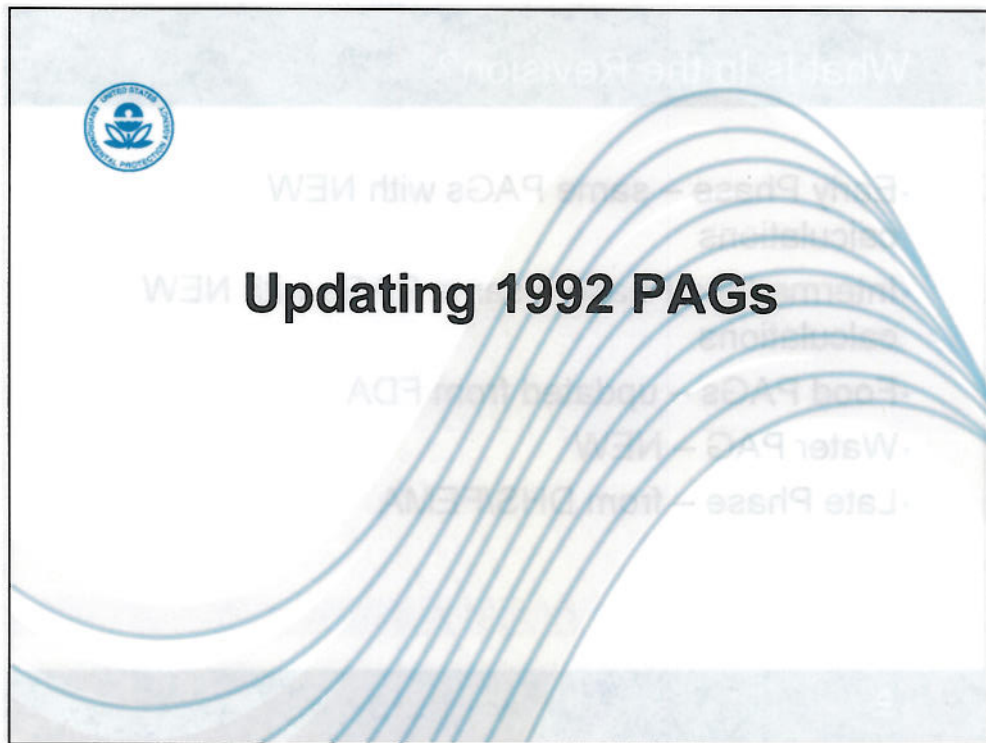
Edward Tupin

Radiation Protection Division

## Overview

- Updating 1992 PAGs
- Status and Next Steps
- DHS/FEMA RDD-IND Guide
- Outreach Strategies
- FAQs Development





Most of the PAGs are the same as the 1992 Manual  
We are including FDA Food PAGs, and DHS/FEMA late phase optimization per  
their ROD/IND guidance (more on that in a few slides)

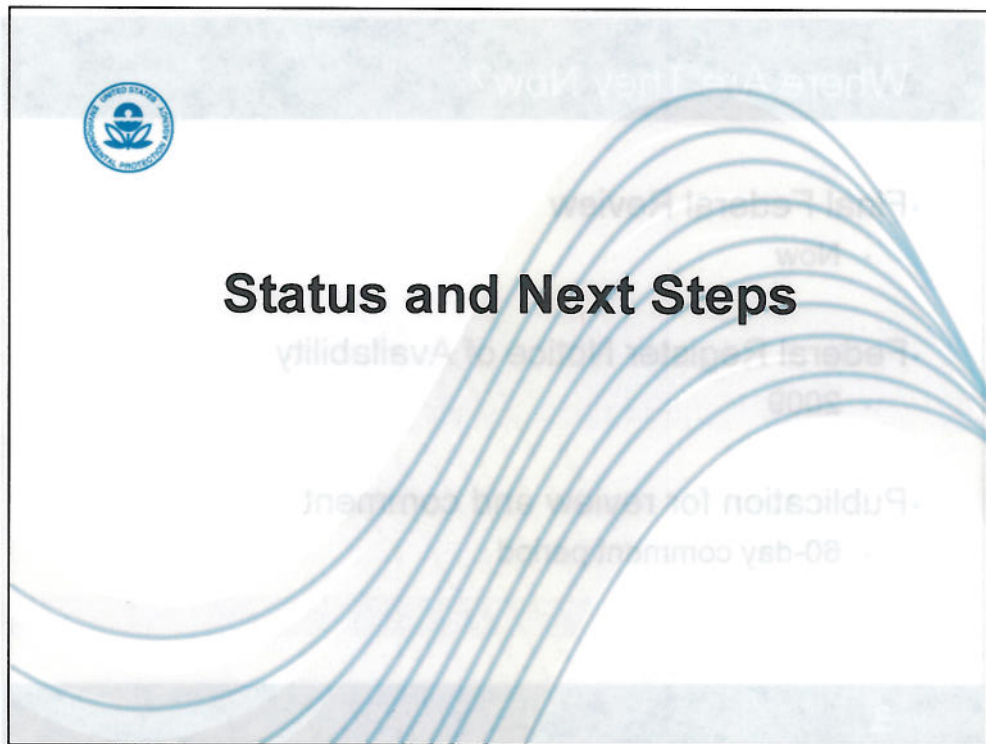
## What Is In the Revision?

- Early Phase – same PAGs with NEW calculations
- Intermediate Phase – same PAGs with NEW calculations
- Food PAGs – updated from FDA
- Water PAG – NEW
- Late Phase – from DHS/FEMA



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Our front office is treating this document as a regulation and putting it through reviews as if it were. We are really not sure how long the PAGs will be in final review, but it'll take about 3 weeks once it's back at EPA to get signed and issued.

## Where Are They Now?

- Final Federal Review
  - Now
- Federal Register Notice of Availability
  - 2009
- Publication for review and comment
  - 60-day comment period



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## Only Issuing Revised Sections

- Most of the PAGs were already re-confirmed in the DHS/FEMA RDD-IND guide
- Seeking public comment only on major updates:
  - New calculations for Early Phase
  - New calculations for Intermediate Phase
    - FRMAC generated with ICRP 60 series basis
  - Drinking Water PAG
- Once public comments are incorporated, we'll issue a complete updated PAG Manual



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- A recent development in the push to get the revision out for public comment is that we're only issuing the sections that weren't already provided for public comment in the DHS/FEMA RDD-IND guidance.

-The sections we're issuing for public comment are the new calculations – they were generated by FRMAC/Sandia National Laboratories and include not only new Derived Response Level tables based on newer dosimetry (ICRP 60 series), but they also include the formulas, methods, assumptions, and examples consistent with the FRMAC Assessment methods. Now FRMAC and EPA PAG Manual methods and values will match.

-The PAG Manual has always allowed and encouraged more current and incident-specific values to be used instead of the published derived levels, and as the FRMAC methods evolve in the future, we know the EPA published values will go out of date again.

## What Next?

- Write response to comments document
- Incorporate comments
- Final reviews
- Finalize, publish, and print
- Continue outreach



I hope we can finalize the Manual quickly after responding to the comments.  
Outreach will continue forever!



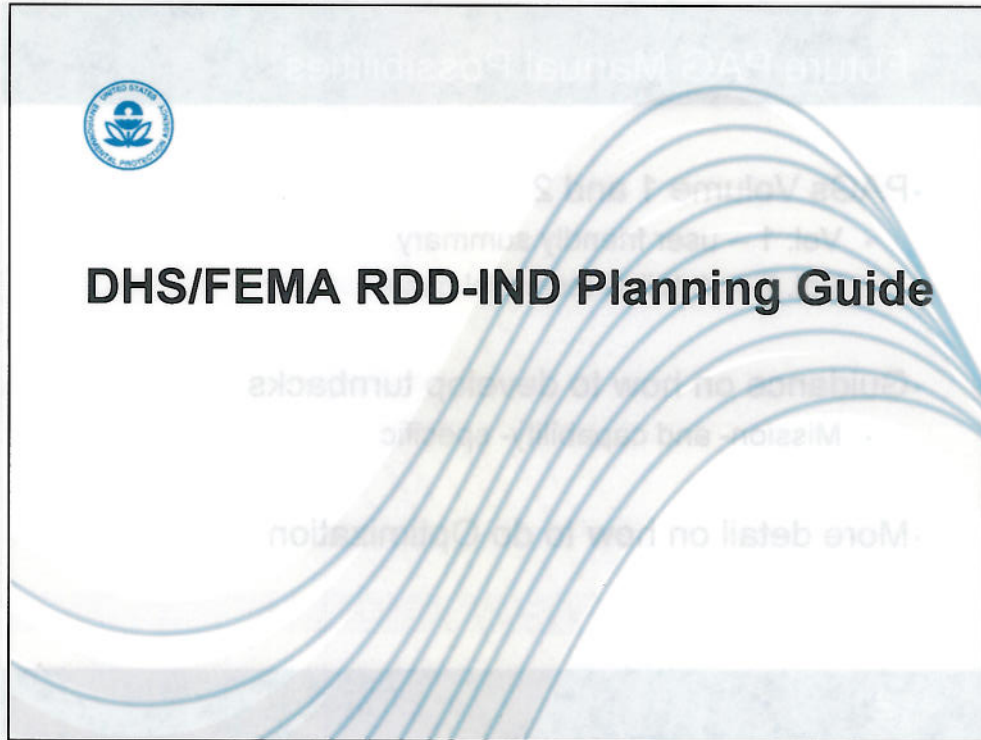
## Future PAG Manual Possibilities

- PAGs Volume 1 and 2
  - Vol. 1 -- user friendly summary
  - Vol. 2 -- detailed technical basis
- Guidance on how to develop turnbacks
  - Mission- and capability- specific
- More detail on how to do Optimization



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- We have gotten many good suggestions on how to improve the PAGs Manual -  
- like providing a more concise volume to use in emergencies, with the technical basis being reserved in a second volume. (Yes, the full revision is 300 pages in a small font!)
- We also might in the future add better information about worker protection, in the form of turnback levels, and there is still discussion of adding more optimization detail.



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## DHS Document Now Final

- Response to comments
  - Public comments
  - Federal comments
- Minor changes to the document (next slide)
- Final guide published in *Federal Register*



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•The final version explains how the RDD/IND guidance and Optimization approach are being incorporated into the forthcoming EPA PAGs Manual revision, so the DHS/FEMA guidance will essentially go away when we publish our EPA PAGs Manual.

## Changes to the DHS/FEMA document

- Enhance guidance for INDs
  - Added guidance with White House lead
  - Public, workers, planners need guidance for first few hours
- Incorporate ICS/NIMS language
  - DHS document drafted prior to NRP/NRF
  - Technical and stakeholder working groups work under IC/UC
- Edit worker health and safety language
  - Not adopting NCRP's 50 rem for lifesaving
- Clearly state relationship to EPA PAG Manual
  - DHS/FEMA document to be incorporated into EPA Manual



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The final RDD/IND guide acknowledged that it was light on IND response for the first few hours – a unique type of response with many challenges beyond radiation

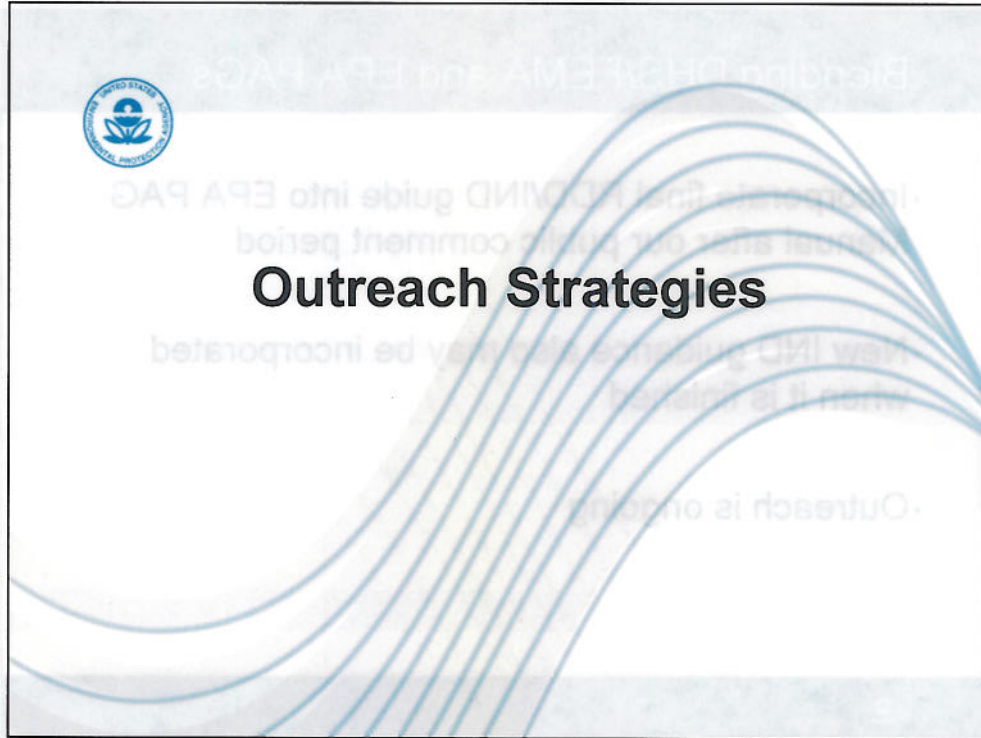
## Blending DHS/FEMA and EPA PAGs

- Incorporate final RDD/IND guide into EPA PAG Manual after our public comment period
- New IND guidance also may be incorporated when it is finished
- Outreach is ongoing



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## Outreach Strategies

- Improved PAGs web page  
[www.epa.gov/radiation/rert/pags.html](http://www.epa.gov/radiation/rert/pags.html)
- New FAQs under development
- Reach out to locals through emergency response, homeland security conferences



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## Outreach Strategies

- Four- hour workshops at NREP and CRCPD in 2007
  - What PAGs do and don't do
  - Refresher on using the Manual
  - Feedback on updates
- The scripted presentation is available for you to use
  - On the PAGs web page



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• Outreach methods can include road shows with the four hour workshops, train the trainer modules, webcasts, DVDs...  
You can borrow from the slides to do presentations!

## Outreach So Far...

- National Radiological Emergency Preparedness Conference
- Conference of Radiation Control Program Directors
- Baltimore-Washington Chapter of the Health Physics Society
- Organization of Agreement States
- EPA's Office of Air and Radiation Assistant Administrators
- Tom Dunne, EPA's Office of Homeland Security
- EPA's Office of General Counsel
- Japan Atomic Energy Agency and Nuclear Security Agency
- Interagency Steering Committee on Radiation Standards
- TOPOFF 4 Planning and Exercise players
- Federal Radiological Preparedness Coordinating Committee
- Armed Forces Radiobiology Research Institute Medical Effects of Ionizing Radiation Course
- Superfund National Radiation Meeting
- EPA OSC Readiness
- Association of State and Territorial Health Officials



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•This is not a complete list!

# Fact Sheet

### Exposure Pathways and Protective Actions


These are examples of exposure routes and various protective actions. The plans are not intended to protect workers every contingency (see site plans).

EXPOSURE PATHWAYS	PROTECTIVE ACTIONS
1. Inhalation of airborne radionuclides	1. Evacuation, relocation, shelter-in-place
2. Inhalation of radon gas	2. Evacuation, relocation, shelter-in-place
3. Ingestion of radionuclides	3. Evacuation, relocation, shelter-in-place
4. Contamination of skin and clothes	4. Evacuation, relocation, shelter-in-place
5. Contamination of food and water	5. Evacuation, relocation, shelter-in-place
6. Ingestion of contaminated water	6. Evacuation, relocation, shelter-in-place
7. Ingestion of contaminated food	7. Evacuation, relocation, shelter-in-place

### What are the Emergency PAGES?

NOTE: Please refer to the 1002 Manual of Protective Action Guides and Protective Actions for Nuclear Incidents, available at [www.epa.gov/protection/pagpgs.htm](http://www.epa.gov/protection/pagpgs.htm), before using any of these PAGES.

EMERGENCY PHASE	PROTECTIVE ACTION	PROTECTIVE ACTION GUIDE
1. Evacuation	Evacuation of the public	1. Evacuation guide
2. Shelter-in-place	Shelter-in-place of the public	2. Shelter-in-place guide
3. Relocation	Relocation of the public	3. Relocation guide
4. Food and water restrictions	Food and water restrictions	4. Food and water restrictions guide
5. Contamination control	Contamination control	5. Contamination control guide
6. Decontamination	Decontamination	6. Decontamination guide
7. Medical surveillance	Medical surveillance	7. Medical surveillance guide




United States  
Environmental Protection Agency

Office of Radiation and Indoor Air  
Radiation Protection Division (R-10)

September 2012  
EPA-404-R-12-009

## Radiological Emergency Response PROTECTIVE ACTION GUIDES (PAGES)



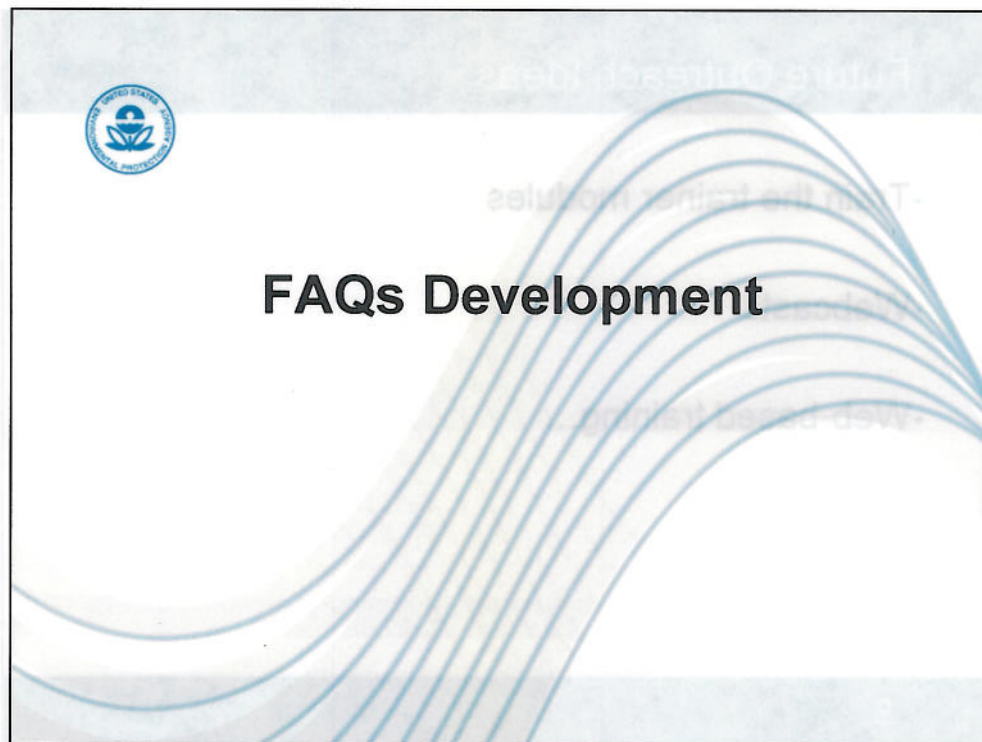
We brought paper copies of this fact sheet --- let us know if you see any ways to improve it, and request additional copies from Sara DeCair (contact info on back of fact sheet).

## Future Outreach Ideas

- Train the trainer modules
- Webcasts
- Web-based training...



We are working on improving the four-hour workshop content and making it into a web-based course with basics, examples, info on the revision, and questions and answers.



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## Frequently Asked Questions

- Developing FAQs for PAGs web site
- Pets, KI, reentry, return, decontamination runoff, dose modeling, SI units, packaged foods, Advisory Team, Federal Guidance, hot zone, public messages, contamination spread, KI for workers, turnback levels, 'valuable property, basis for PAGs, optimization, cleanup benchmarks, etc...
- Adding questions received at outreaches



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•FAQs are a great place to say more than we can or should say in the Manual itself – we have more freedom to clarify, provide examples, and provide further guidance than exists in the Manual. We can help more people get more out of the PAGs and not make the book bigger as a result!

## How to Stay Sharp

- Web site
  - [www.epa.gov/radiation](http://www.epa.gov/radiation)
- Give outreach presentations
  - You don't even have to write the presentation!
- Exercise participation
  - Nuclear power plant exercise evaluator or observer



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Ways to stay in touch with the PAGs...



## **Questions and Comments**

